

Grid West

Grid West Cost Discussion Module 5

Draft for Discussion with TSLG – October 21, 2004

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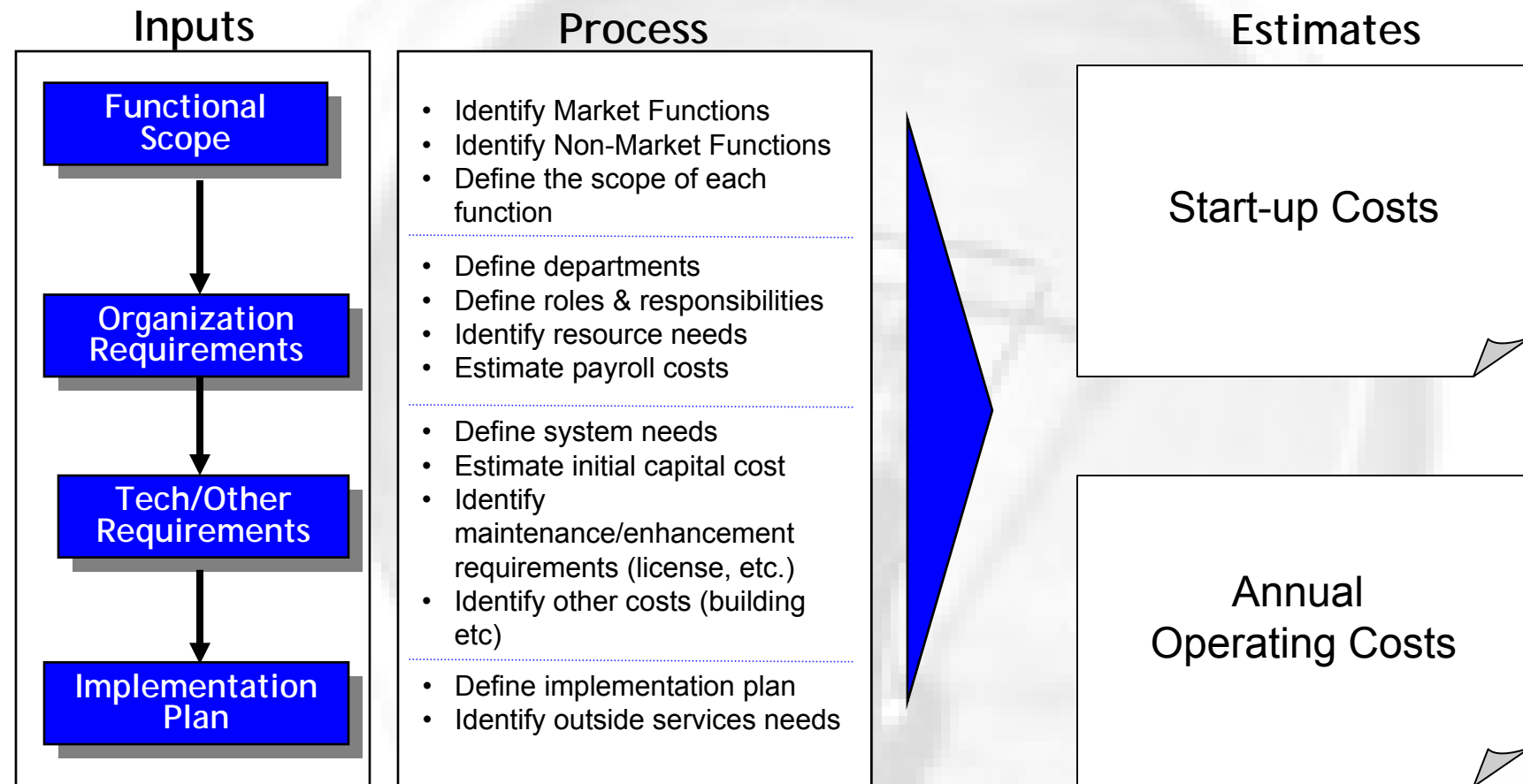
- **Background**
- **Challenges & Considerations**
- **Module 5 - Grid West Functional Scope**
- **Module 5 - Grid West Organization Requirements**
- **Module 5 - Grid West Technology Requirements**
- **Module 5 - Grid West Implementation Plan**
- **Summary**
- **Next Steps**

Module 5 of the TSLG work, will produce an implementation plan and a bottom-up estimate of start-up costs for creating the Beginning State. It will also provide an estimate of the ongoing operation costs of Grid West. This bottom-up estimate will be based on the following:

- **Determine the detailed functional scope of Grid West**
 - Analyzing costs in terms of Start-up, Annual Operating Costs, and Market re-design (Beginning State vs. End State)
 - Market vs. Non-Market Functions
 - Regional vs. Consolidated Control Area features
- **Determine the inputs to the estimate**
 - Define the organization
 - Divisions, departments, etc.
 - Identify the technology needs
 - EMS, auction software, settlements systems, etc.
 - Identify other cost items
 - Building, working capital etc
 - Develop an implementation plan
 - Phases, Timeline, etc.

Background Approach

A detailed bottom-up cost estimate for both start-up and annual operating costs needs to be based on the Grid West functional scope, resource, technology and implementation requirements:



Challenge & Considerations Overview

The RRG has requested the TSLG provide a cost estimate to support the decision making process currently underway. In developing a cost estimate the following challenges and considerations should be kept in mind:

- **Top-down estimates vs. Bottom-up estimates**
 - Top-down estimates can be calculated quickly but are less precise
 - Bottom-up estimates are more accurate and based on the underlying cost components
 - Module 5 is a bottom-cost estimate
- **Additional design work is required to complete a bottom-up estimate**
 - TSLG has only completed layer 1 design of the Beginning State
 - There are many unknowns which will have an impact on the functional scope of Grid West.
- **Bottom-up cost estimates require a firm understanding of the functional scope (e.g., market design)**
 - What functions will Grid West perform?
 - What is the scope of each function?
 - How many FTEs will be required?
 - What systems will be required?
- **Bottom-up cost estimates take time**
 - Typical bottom up takes 8-12 weeks, based on a well defined market.

Challenge & Considerations

Unknowns

After completing “layer one” of the market design, there are still too many unknowns to develop a meaningful bottom-up cost estimate:

- What facilities will be used as the primary and backup dispatch centers?
- What existing infrastructure (e.g., facilities, systems) can be leveraged?
- What incremental infrastructure requirements (e.g., metering, EMS applications, etc.) are required to support the Consolidated Control Area?
- What tasks will be performed by the PNSC vs. Grid West?
- What role will Grid West play in Tariff Administration (e.g., Company Rate determination, etc.)
- Who will perform the Reliability Authority function for the Grid West geographic region (e.g., CAs vs. Grid West)?
- How quickly does Grid West want to implement the Beginning State (e.g. 15 months, 24 months, etc.)?

At the conclusion of the next round of design, additional design details should be known and a more meaningful bottom-up estimate can then be performed....

Grid West can be separated into three distinct functional areas:

- **Regional Functions**

- Planning, Tariff Administration, Reconfiguration Services, Scheduling Services, Regional Settlements

- **CCA Functions**

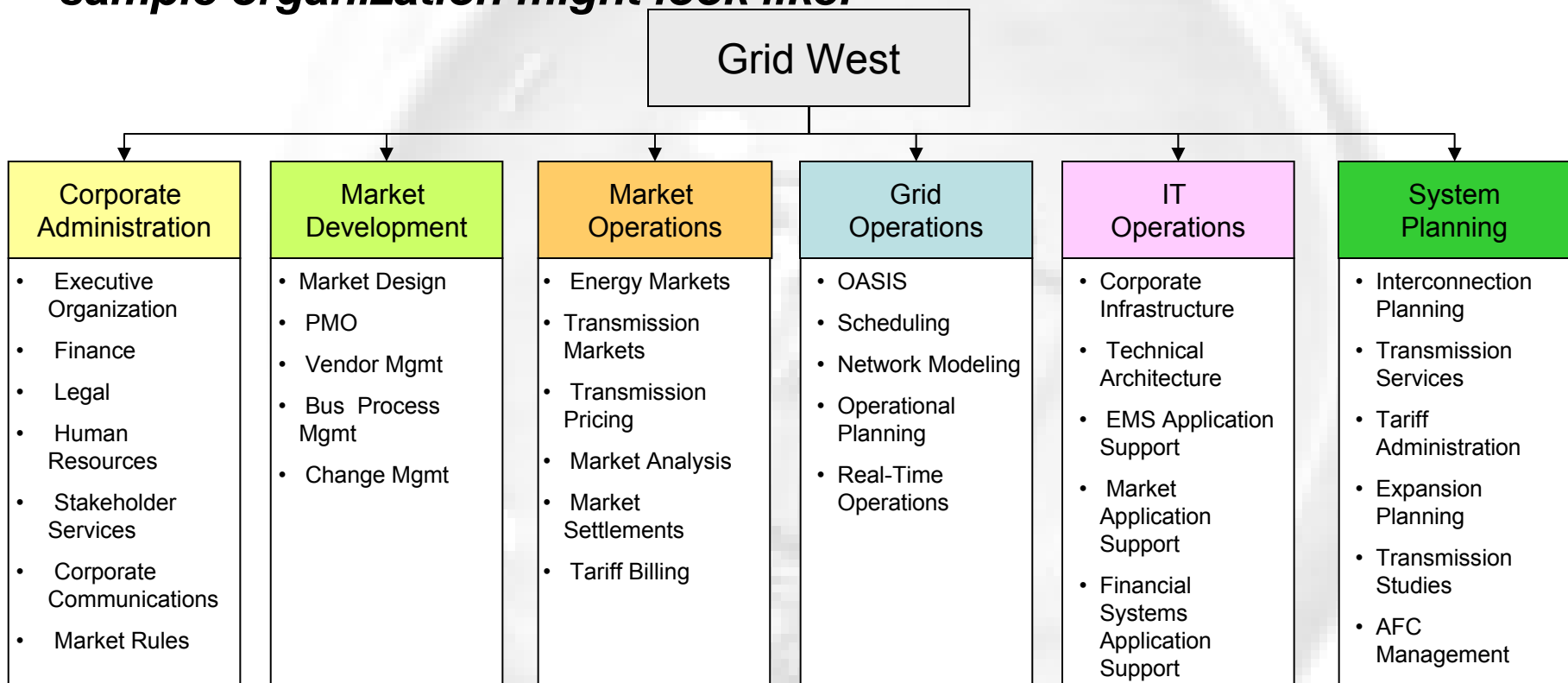
- Market Operations
 - Reserve Markets
 - Real-Time Energy Market Services
 - CCA Settlements
 - Meter Data Management
- Grid Operations
 - Generation Dispatch (CCA Mkt Functions)
 - Transmission Dispatch (CCA vs TO?)
 - Scheduling (Pre and Real-Time)
 - Gen and Txn Outage Co-ordination

- **Support Functions**

- Finance, Human Resources, Legal, IT

Organization Requirements Overview

Since the largest cost driver for both start-up and annual operating costs is salary and benefits, a bottom-up estimate requires a detailed understanding of the organization and its technology needs. A sample organization might look like:



For each department, we would define the functional scope, the resource requirements, and the technology needs to support those functions. We have included the market settlements department as an illustrative example:

Functional Scope & Assumptions

- Market Settlements will settle imbalance energy, reserves, and reconfiguration services
- Market Settlements will be performed only on Business Days (Monday – Friday)
- Up to 12 settlements (Initial, Final, and 10 Resettlements) can be performed in a day

Resource Requirements

Title		Count
Settlements Manager	TBD	1
Settlements Leads/Analysts	Data Validation, Batch Execution, Statement Verification	5
TOTALS		6

Technology Requirements

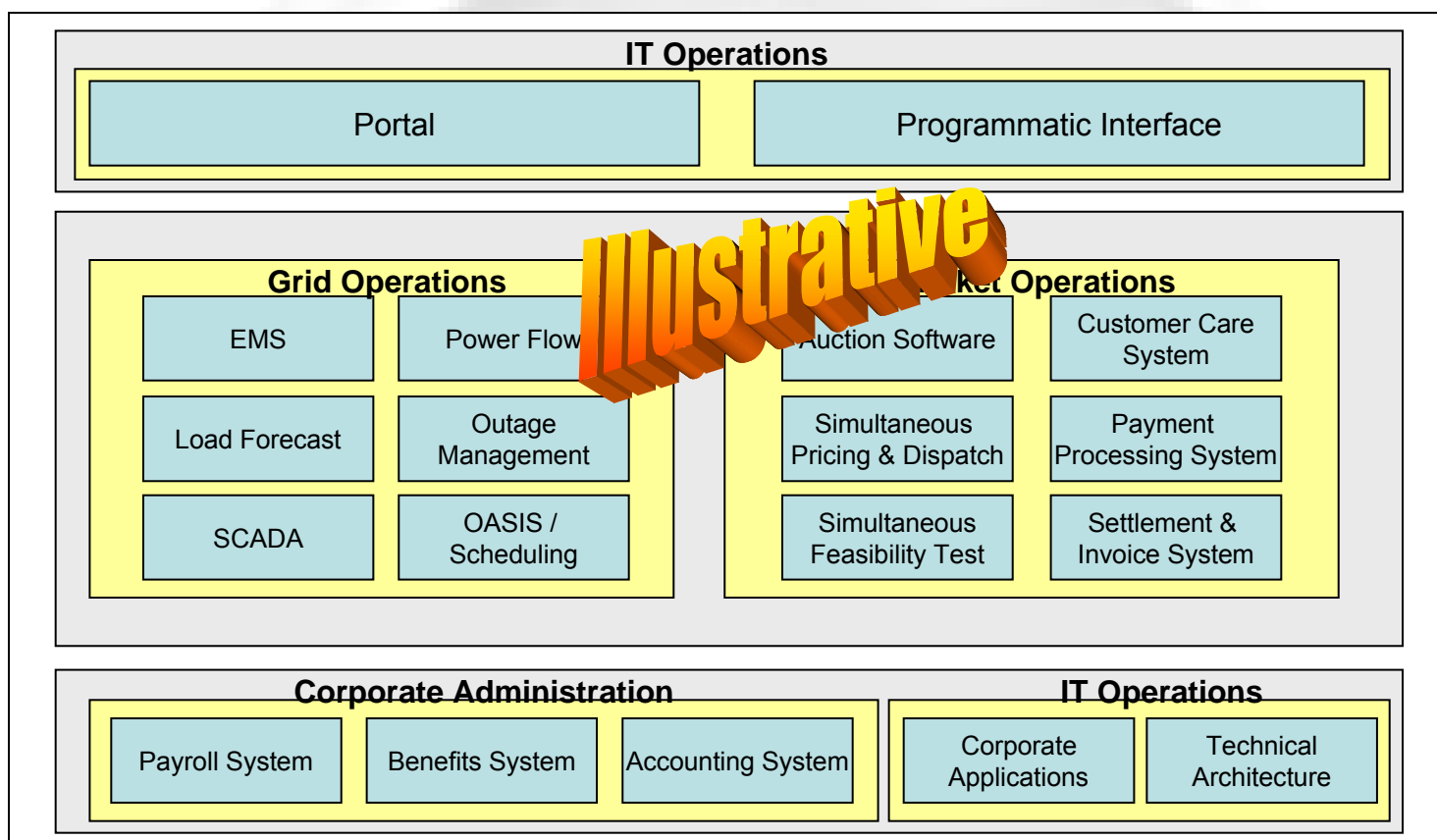
System	Description
Market Settlement System	Rules-based, configurable settlement engine to support GW charge types

Cost Factors

- # of resettlements
- Third-party vs. Custom solution
- # of market changes

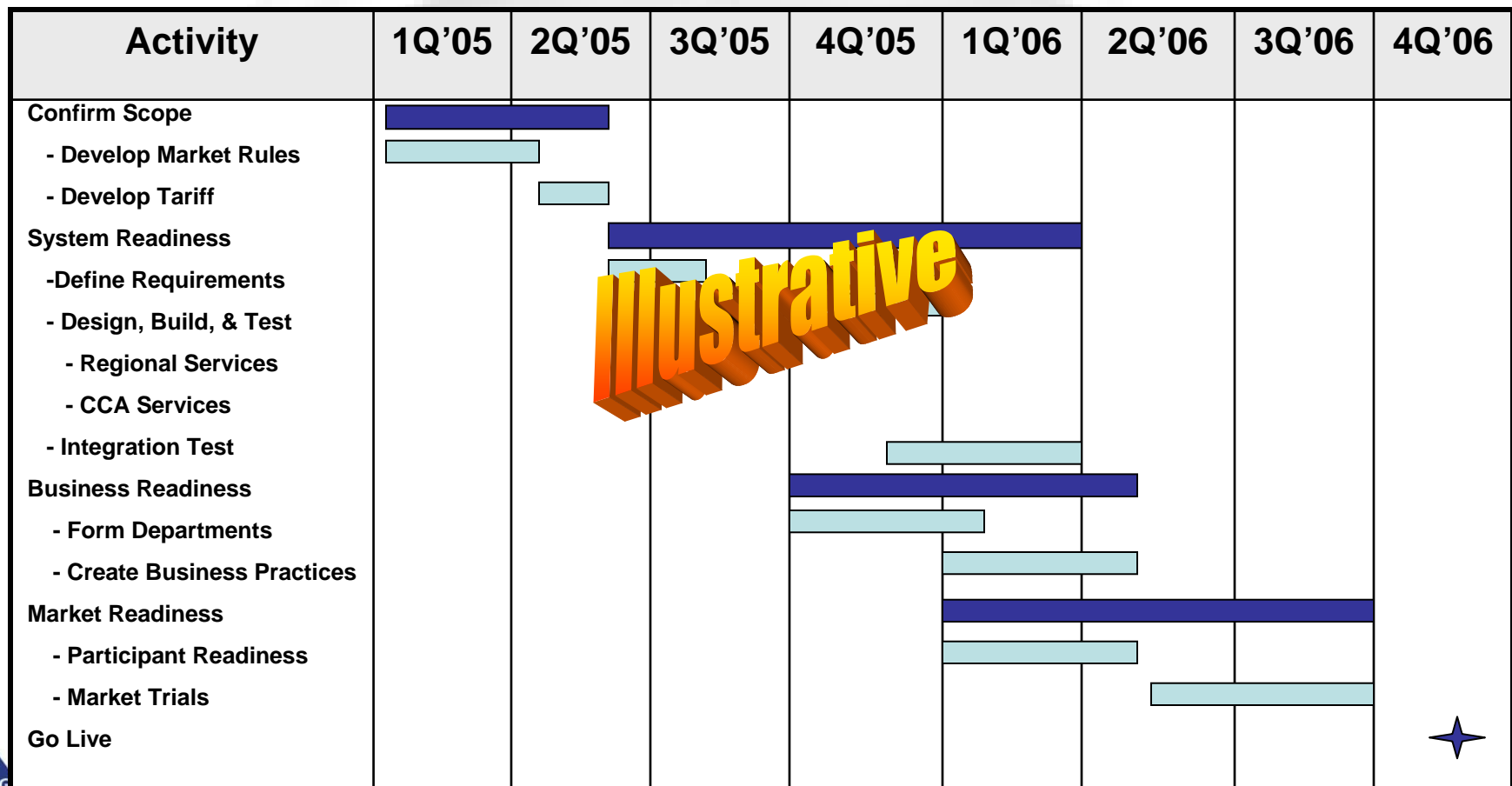
Technology Requirements Overview

Another cost driver is system costs. A bottom-up estimate requires a detailed understanding of technology needs. A sample technology schematic might look like:



Implementation Plan Overview

Another cost driver for start-up costs is the implementation plan. A bottom-up estimate requires an understanding of the implementation timeline and tasks involved.



Summary

Key Cost Drivers

Once the functional scope, the resource requirements, and the technology needs have been defined, their associated costs can be grouped into the following categories:

- **Salary & Benefit Costs**
 - Number of FTEs, average loaded costs
- **Hardware/Software Maintenance & Licensing**
 - Procurement cost, maintenance agreements, license agreements, implementation services
- **Facility Costs**
 - Space needs, lease costs etc.
- **Outside Services Costs**
 - Number of contractors, degree of outsourcing
- **Other**
 - Cost of capital, etc.

The following should be kept in context when evaluating potential Grid West costs:

- Wholesale scope, no retail components
- Scope of the “Beginning State” compared to other RTOs
- Interim and Advanced states will get more complex
- Grid West is not first to market
- There are no legislated/mandatory deadlines
- Market design and build are not concurrent
- Vendor market place is smaller, but still hungry
- No existing facilities or organization – Can Grid West participants be leveraged?
- Multiple regulatory bodies will add complexity and cost

Summary

Avoiding Costs

The following key considerations are worth noting to minimize the start-up, re-design, and O&M costs of Grid West:

- **Build and Design Timing** – Completing the market design or re-design prior to the build phases will result in lower start-up/re-design costs.
- **Build and Regulatory Approval** – Minimizing spending on systems before major regulatory hurdles have been cleared will likely reduce costs.
- **Contract Terms** - Creating the proper incentives and risk sharing mechanisms will mitigate startup costs/risks. Change management processes can manage risk and cost tremendously
- **System Flexibility** – Implementing systems that are flexible to change and are not reliant on a single vendor will reduce re-design costs.
- **Costs of changing market functionality** – Do the cost benefit before making a market design change.
- **Leverage other markets functionality when regional differences don't come into play** – if it can be re-used, costs will be reduced.
- **IT leading edge** – avoid paying for vendor development.

Next Steps to Develop Bottom-Up Estimate

Grid West should perform the following 'Next Steps' in order to complete a detailed bottom-up cost estimate:

- **Complete the next round of Beginning State design**
 - Confirm functional scope
 - Identify high-level resource requirements
 - Identify high-level technology requirements
- **Continue to develop the bottom up cost template**
 - Cost categories
 - Organizational structure
- **Develop Implementation Plan**
 - Tasks
 - Timeframes
- **Research other ISOs/RTOs**
 - Benchmarking
 - FERC Form 1 Data
 - Public Accounting Audits
- **Develop Estimates**